

Collection and Purification of Lunar Propellant Resources, Phase I

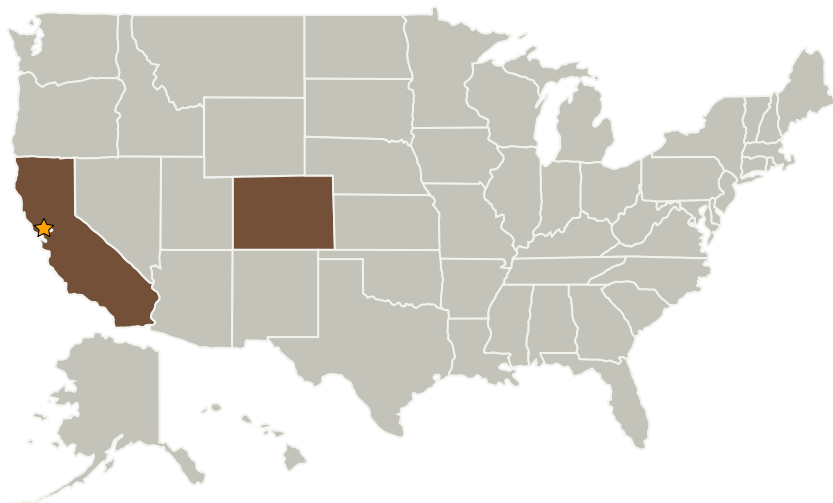
Completed Technology Project (2005 - 2005)



Project Introduction

Technology Applications, Inc. (TAI) proposes to advance In-Situ Resource Utilization (ISRU) capabilities by applying advanced cryogenic technology to perform collection and purification of volatile propellant materials extracted from moderate to high vacuum environments such as those found on the Martian and lunar surfaces. In this Phase I program, TAI will perform design and analysis of critical ISRU subsystems and develop innovations in thermal management to demonstrate the feasibility of effective volatile collection, separation, purification, liquefaction, and long-term storage capabilities for cryogenic fluids. Production of propellant from the lunar surface is a technically feasible approach to avoid the cost prohibitive task of launching sufficient amounts of propellant from earth to establish continual human habitation on the moon. When regolith resources are extracted and refined, there exists the potential for sustainable long-term human habitation on the moon and Mars. Thermal system design for an ISRU system will determine the propellant generation power requirements for complete human habitat system specifications.

Primary U.S. Work Locations and Key Partners



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Organizational
Responsibility**Responsible Mission
Directorate:**

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Technology Applications, Inc.	Supporting Organization	Industry	Boulder, Colorado

Primary U.S. Work Locations

California	Colorado
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Steve Nieczkoski

Technology Areas

Primary:

- TX07 Exploration Destination Systems
 - └ TX07.1 In-Situ Resource Utilization
 - └ TX07.1.2 Resource Acquisition, Isolation, and Preparation